

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

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10 NOV 2004

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year)

08.11.2004

Applicant's or agent's file reference
J00/PCT/NO03/00313

IMPORTANT NOTIFICATION

International application No.
PCT/NO 03/00313

International filing date (day/month/year)
10.09.2003

Priority date (day/month/year)
10.09.2002

Applicant
EPSIS AS et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international
preliminary examining authority:



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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

| | | | |
|--|--|--|--|
| Applicant's or agent's file reference JOO/PCT/NO03/00313 | | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416) | |
| International application No. PCT/NO 03/00313 | International filing date (day/month/year) 10.09.2003 | Priority date (day/month/year) 10.09.2002 | |
| International Patent Classification (IPC) or both national classification and IPC G01N27/00 | | | |
| Applicant EPSIS AS et al. | | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

| | |
|---|--|
| Date of submission of the demand 01.04.2004 | Date of completion of this report 08.11.2004 |
| Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | Authorized Officer Johnson, K Telephone No. +49 89 2399-2240  |

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/NO 03/00313**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-9 as published

Claims, Numbers

1-20 filed with telefax on 19.07.2004

Drawings, Sheets

1/3-3/3 as published

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|--------------|
| Novelty (N) | Yes: Claims | 2-7 13-16 |
| | No: Claims | 1 8-12 17-20 |
| Inventive step (IS) | Yes: Claims | |
| | No: Claims | 1-20 |
| Industrial applicability (IA) | Yes: Claims | 1-20 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

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EXAMINATION REPORT - SEPARATE SHEET**

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Section V. Reasoned statement under Article 35(2) PCT

1. The following documents are referred to in this report:

D1 = US-A-5 389 883
D2 = US-A-5 549 008
D3 = WO-A-01 078 74
D4 = PROCEEDINGS OF 1ST WORLD CONGRESS ON
INDUSTRIAL PROCESS TOMOGRAPHY, 14 April 1999 - 17
April 1999, BUXTON, GB, pages 306 - 312, XP002976895;
PEYTON A.J. et al: 'Development of electromagnetic
tomography (EMT) for industrial applications. Part 1: sensor
design and instrumentation'

2. Document **D1** discloses a method for determining the content of a conductive component of a multiphase flow through a pipe, in particular water in a flow of oil, gas, and water (cf. D1, column 2, line 22- column 3, line 19; figures 1, 2, 5). The principle of the method resides in measuring the effect of the flow on the frequency and amplitude of the resonant peaks of two coil resonators, operating at different frequencies because of different geometries, arranged about the fluid conducting pipe.

Thus, in the view of the International Preliminary Examination Authority (IPEA), the only significant difference between this method and the applicants' lies in the frequency range employed. In **D1**, RF (0.5 - 1.0 GHz) else microwave (1.0 - 20.0 GHz) frequencies are used. This contrasts with the preferred range of 1.0 - 10.0 MHz adopted by the applicants. But the frequency range to be used is not a feature of claim 1.

Therefore the IPEA can only conclude that **D1** is novelty destroying for claim 1 as currently worded.

3. In any case, document **D2** teaches a method for determining the conductive content of a multiphase flow through a pipe based on eddy currents in just this the preferred frequency range (cf. D2, column 2, line 3 - column 8, line 13; figures 1-6). The

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method comprises:

- supplying alternate voltage to one or more coils being arranged around the fluid conducting pipe, and
- detecting the attenuation of the magnetic fields due to the induced power loss, or the coil impedance at resonance, dependent on the conductivity of any conductive component of the fluid flow, by
- measuring the impedance of the coils at resonance frequency, said impedance varying as a function of content of the conductive phase, using a first coil and a second coil (cf. in particular D2, column 7, lines 12-14). By measuring the signals in the first coil and in the second coil, and cross-correlating, the effect of particulates, especially water droplets, can be accommodated.

- 3.1 In contrast, the method of claim 1 compensates for the problem of droplet size distribution and water conductivity '... by using two different coils of different resonance frequencies...' (cf. current application, page 5, paragraph 4). So the objective technical task to be solved by the skilled person in the light of D2 was simply to provide an alternative way of compensating for the influence of droplet size distribution and water conductivity.
- 3.2 But an alternative way for compensating for these effects has already been proposed in document D3. In particular, '... a measurement with a parallel standing excitation coil with a different resonance frequency is needed' and '... the frequency is determined by the... number of windings' (cf. D3, page 8, lines 5-13; page 4, lines 13-15). Consequently, an obvious solution to the technical task set above would be to combine the teachings of D2 and D3. This is especially so, because D2 already contemplated using two coils. In this way¹ the skilled person would arrive at subject matter falling within the scope of claim 1.
- 3.3 Therefore claim 1 lacks inventive merit over the combination of D2 and D3, in contravention of **Article 33(3) PCT**.
4. Moreover, the additional features introduced by the dependent claims 2-8 provide no basis for new and inventive subject matter either:

¹i.e. without recourse to inventive skill.

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- 4.1 The additional features of claims 2, 5, and 6 have been disclosed in **D3** anyway. So the combination of **D2** and **D3** automatically yields the subject matter of these claims as well.
- 4.2 Claims 3, 4, and 7 describe routine precautions else design options that the skilled person would seek to optimise in implementing the teaching of claim 1. Adopting such measures does not betoken inventive skill.
- 4.3 The subject matter of claim 8 contradicts that of claim 1, because only a single coil is employed. This engenders doubt regarding the scope of protection afforded by the claims, and renders them unclear, in breach of **Article 6 PCT**. In any case, this subject matter has been fully disclosed in document **D2**, because the optional feature of a 9-turn coil does not limit the scope of the claim. Therefore claim 8 contravenes **Article 33(2) PCT** as well.
5. Electromagnetic tomography, and its suggested use in industrial applications, eg. monitoring water distributions in pipelines, have been fully disclosed in document **D4**. So the IPEA takes the view that **D4** is novelty destroying for claims 9-11.
6. In claims 12-16, the method features of claims 1, 7, 3, 4, and 8 have been replaced by equivalent apparatus features. So the arguments of paragraphs 2-4.3 above apply *mutatis mutandis*. Hence this subject matter also cannot be deemed new and inventive. Similarly for claims 17 and 18 in the light of paragraph 5.
7. Finally, the application of such apparatus to the field of multiphase flows comprising oil, water and gas, as in claims 19 and 20, also appears obvious in the light of the cited prior art.
